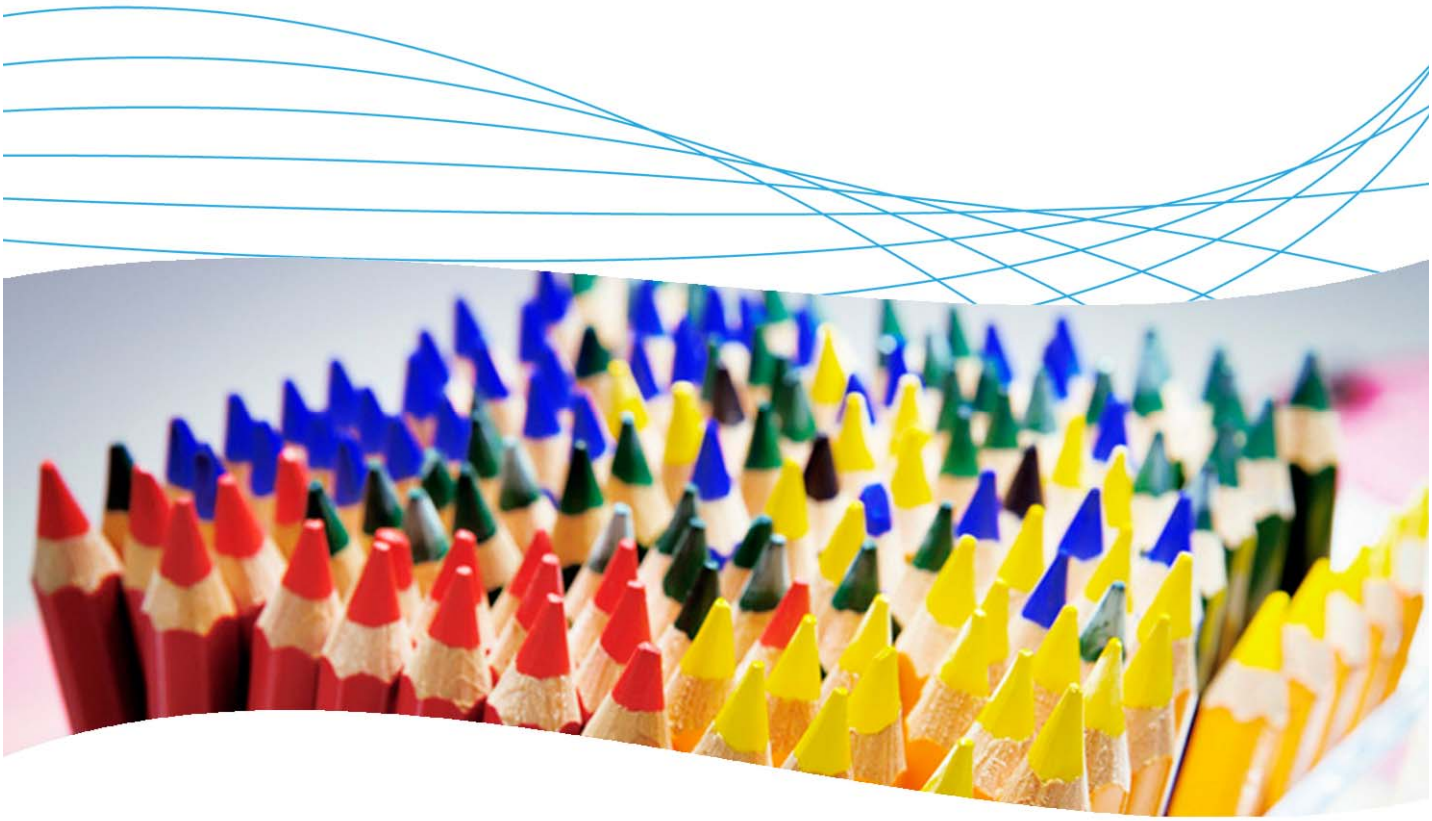
An HP ProCurve Networking Application Note

Interoperability between the Aastra Wireless Phone 312 and ProCurve Wireless Services



Contents

1. Introduction

This document describes how the interoperability of the ProCurve wireless services solution and an Aastra wireless phone 312 can be used to provide a secure VoWLAN solution with the following services:

- Secure wireless encryption with WPA/WPA2
- Fast roaming
- Quality of Service on the wireless media, with WMM
- Unscheduled Automated Power Save Delivery (uAPSD)

2. Prerequisites

You have a ProCurve Switch 5406zl or 8212zl with a Wireless Services Edge Module zl and radio ports installed. The radio ports have been discovered.

For more information on this configuration please refer to application note AN-M1, *Extend your wired network to wireless*.

3. Network diagram

Figure 1 details the configuration referenced in this section.

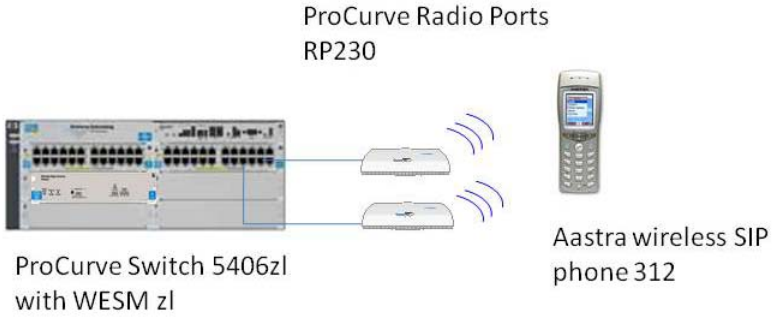


Figure 1. System configuration

Equipment needed:

- A ProCurve Switch 5406zl with latest firmware version.
- A Wireless Edge Services Module zl (WESM zl) plugged into a slot of the 5406zl.
- 2 radio ports (RP210 or RP230)
- A management server configured as a domain controller, with a RADIUS server installed (IAS in this application note) and ProCurve Manager Plus (optional).
- An Aastra 312 wireless SIP phone.

4. Secured wireless encryption

The Aastra wireless SIP phone 312 supports the following security options:

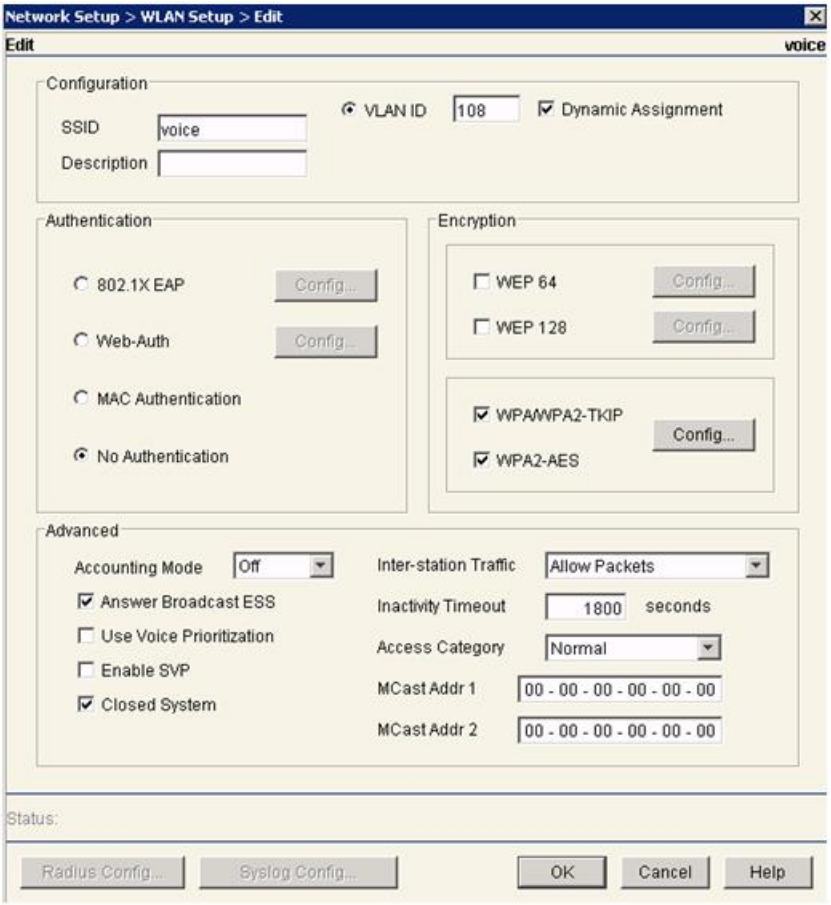
- WEP
- WPA1-PSK
- WPA2-PSK

This section describes how to configure WPA2-PSK authentication.

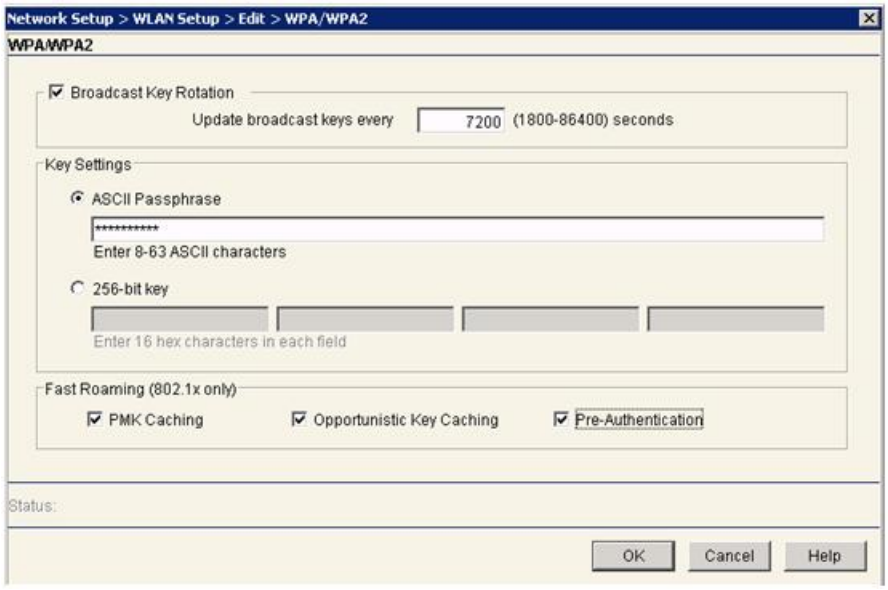
4.1 Configure encryption on the WESM

To configure the Wireless Edge Services Module for encryption:

1. On the Wireless Edge Services Module, go to Network Setup > WLAN Setup and create a new WLAN called voice.
2. Configure this WLAN as follows:
   - SSID: voice
   - VLAN ID: The VLAN to which you want the phone to be assigned. You must use the switch menu to tag this phone on the WESM uplink. (For details, refer to application note AN-M1, *Extend your wired network to wireless*, or to the *Wireless Services Module Administrator Guide*).
   - Authentication: No Authentication.
   - Encryption: WPA/WPA2-TKIP and WPA2-AES.



3. Click on the Config button. You see a window for configuring the pre-shared key. Set the parameters as follows:
    - ASCII passphrase: procurve
    - Check the boxes to enable all three Fast Roaming options: PMK Caching, Opportunistic Key Caching and Pre-Authentication.



4. Click OK to return to the main window.
5. On the main window Advanced section, check the Closed System box to enable it.
6. Finally, to enable the new WLAN, click the Enable button at the bottom of the WLAN list screen.

4.2 Configure the Aastra wireless SIP phone 312 for encryption

To configure the Aastra Phone 312:

1. From the main screen of the phone choose Menu, then use the arrows to select System.
2. In the System menu choose Network.
3. From the Network menu choose Profiles. Then choose Options | New to select a new profile.
4. Configure the new profile as follows:
    - Profile Name: Aastra VOIP
    - Region: Use the arrows to select your region (e.g., Europe)
    - SSID: voice
    - Security: Use the arrows to select WPA2-PSK
    - WPA key: procurve
    - IP address: Static, or use DHCP
5. If prompted for a PIN code, enter 22222 (the default PIN).

6. If you use DHCP assignment, configure the following options on the DHCP server:

Supported DHCP options

DHCP options supported by the Aastra Phone 312

Designation	Name	Length	Meaning	Reference	Comment
1	Subnet mask	4	Subnet mask value	[RFC2132]	Optional
2	Time offset	4	Time offset in seconds from UTC	[RFC2132]	Optional
3	Router	N	N/4 Router addresses	[RFC2132]	Optional, only first entry used
6	Domain server	N	N/4 DNS server addresses	[RFC2132]	Optional
15	Domain name	N	The DNS domain name of the client	[RFC2132]	Optional
42	NTP servers	N	NTP Server addresses	[RFC2132]	Optional, only first entry used
43	Vendor specific information	N	Vendor specific information	[RFC2132]	Necessary if accounts are configured per DHCP, otherwise optional

Used producer-dependent options (vendor specific information)

Designation	Name	Length	Type	Meaning	Comment
17	Country	2	u16	Country, see table below	Optional
20	System name	N	text	Name of account	Optional
21	SIP proxy	N	text	SIP proxy address[name[:port]	Necessary if accounts are configured per DHCP, otherwise ignored
22	SIP registrar	N	text	Registrar address[name[:port]	Optional
23	SIP outbound Proxy	N	text	Outbound proxy address[:port]	Optional
24	SIP user ID	N	text	SIP user ID	Necessary if accounts are configured per DHCP, otherwise ignored
25	SIP password	N	text	Registrar address[name[:port]	Optional

Note: *Illustration from Aastra Phone 312 User Guide.*

7. Once the profile is configured click OK, then click Back as many times as needed to go back to the Main screen. If the profile is correctly configured, in the phone display's upper left corner you will see a small icon showing the signal strength.
8. To test for connectivity, ping from the phone to an IP address on the network. Go to Menu | System | Network | Tools | Ping.
9. Enter the IP address you want to ping and click OK. You should obtain a window showing the different ping attempts, the ping statistics (tx, rx, % loss), and the average response time.
10. On the WESM, you can now see the phone in Device Association > Wireless stations. You should see the MAC address, IP address, WLAN, VLAN, and Radio Index. For example:

11. On the Aastra Phone 312 you can view similar info in System | Network | Info.

5. Fast roaming

Layer 2 roaming occurs when a phone that was associated to a radio port moves to another radio port adopted by the same WESM. The phone remains in the same VLAN.

Layer 3 roaming occurs when a phone moves between two radio ports associated to different WESM modules. The voice WLAN is associated to different VLANs (and subnets) on the two modules. In this case, the phone keeps its original IP address but the voice flow is tunneled by the current module to the home module.

For more information on L2/L3 roaming configurations, please refer to application note AN-M3, *How to configure L2 and L3 wireless roaming*.

5.1 About fast roaming

To enable a phone to quickly make the transition between two radio ports and reduce the roaming time, you normally configure the following options: PMK caching, opportunistic key caching, and pre-authentication. However, these options apply to 802.1X authentication only, which is not supported by the Aastra wireless phone. (For this reason, we configured WPA2 with a pre-shared key instead.)

5.2 Configure self-healing

The self-healing feature of the Wireless Edge Services Module enables associating neighbors to each radio port. In case of failure of a radio port, the neighbors will increase their coverage. You can also enable interference avoidance.

To configure self-healing on the WESM:

1. From Special Features > Self Healing, click the Enable Neighbor Recovery check box.

2. You can also click the Enable Interference Avoidance check box.
3. From the Neighbor details tab click Detect Neighbors. You see the Neighbor Details window.

Radio Index	Description	Type	RP Ethernet MAC	Action	Neighbor Radio Indices
1	RADIO1	802.11bg	00-14-C2-A0-6B-D0	Both	2,4
2	RADIO2	802.11bg	00-17-A4-9B-6F-0B	Both	1,4
3	RADIO3	802.11a	00-17-A4-9B-6F-0B	Both	6
4	RADIO4	802.11bg	00-17-A4-9B-6F-57	Both	1,2
5	RADIO5	802.11a	00-17-A4-9B-6F-57	Both	None
6	RADIO6	802.11a	00-14-C2-A0-6B-D0	Both	3

4. In the Neighbor Details window, select a radio and click Edit. You can edit a radio to check that other radios with same 802.11 mode (a or b/g) have been listed as neighbors.

5.3 Test the roaming time

You can determine the roaming time by first using the WESM to determine the radio port to which the phone is associated. To test roaming time:

1. From Device Association > Wireless Stations, note the radio's Station Index.
2. Go to Device Association > Radio Adoption Statistics and determine the MAC address of the corresponding radio port.
3. To determine the switch port associated with this MAC address, use ProCurve Manager's find node tool.
    - Use the command show lldp info remote all on the switch if the radio ports are connected at layer 2.
    - Or use show arp if the radio ports have IP addresses.
4. From the Aastra phone Ping tool, launch a ping to the IP address of the Aastra Call Controller, or else to the network default gateway if no call controller is present. The ping launched from the Aastra phone Ping tool is a continuous ping.
5. From the switch CLI or Web agent disable the port of the RP to which the phone is associated. The phone should lose one or two pings, then subsequent pings should be successful again.

   If you have an Aastra Call Controller (Aastra 5000 or Aastra 800, for example) up and running on the network, you can initiate a phone call to another phone on the network and then disable the radio port. The communication link should remain on, and the voice should be lost for less than one second.

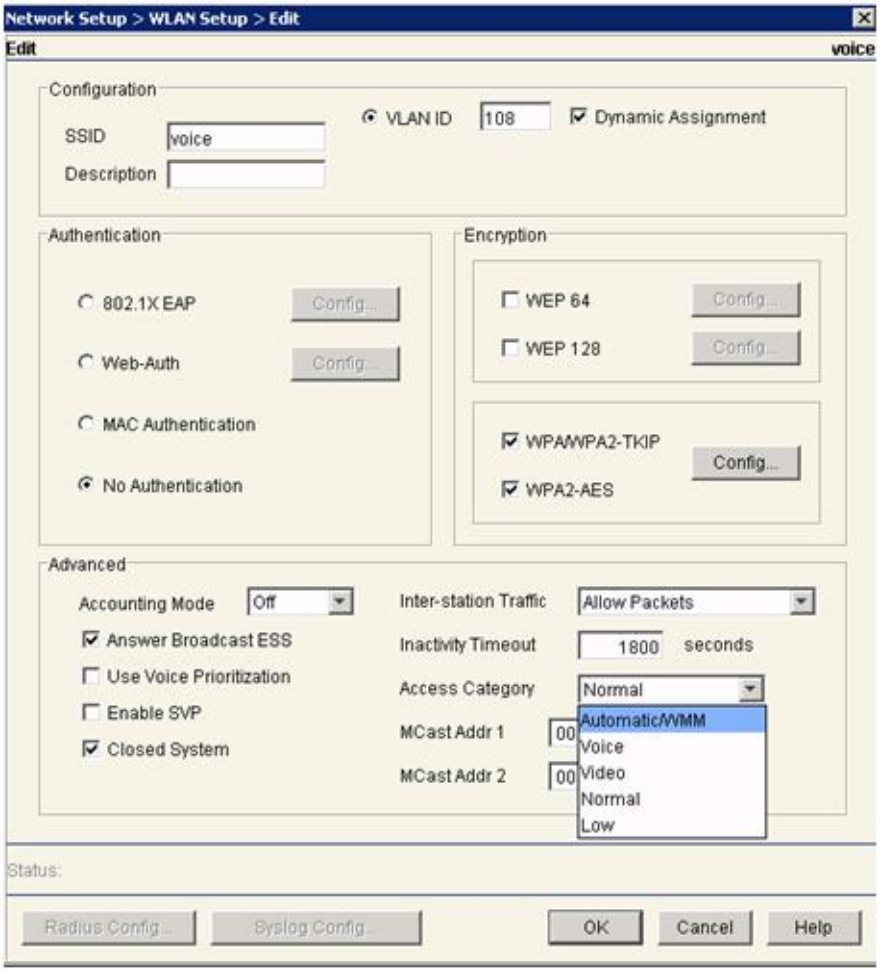
6. Configuring 802.11e and uAPSD

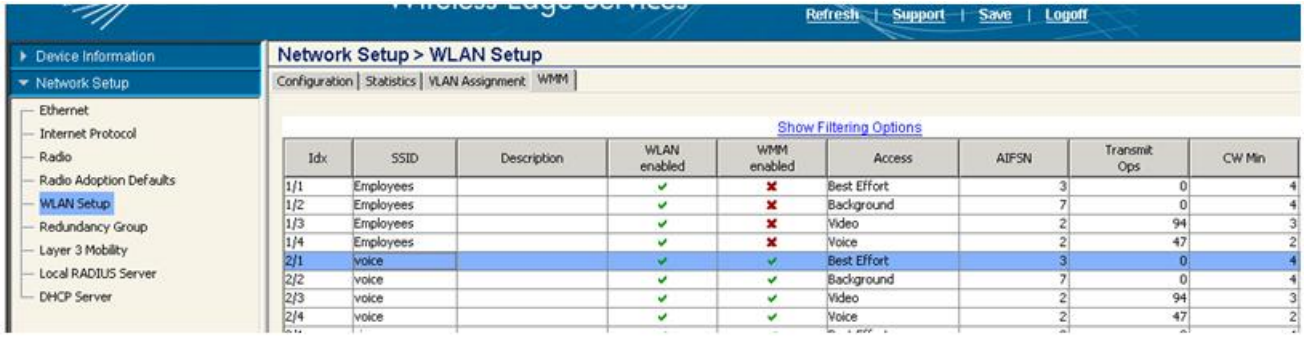
This section details how to configure WMM (802.11e) and the Unscheduled Automatic Power Save Delivery (uAPSD) features.

6.1 Configure WMM on the WESM

To configure WMM on the Wireless Edge Services Module:

1. Edit the voice WLAN.
2. In Advanced Parameters, set the Access Category to Automatic WMM.
3. In Network Setup > WLAN Setup > Edit screen, go to the WMM tab and verify that the voice VLAN is configured for WMM with four queues: Voice, Video, Background and Best Effort.
4. If desired, you can modify the parameters of these different classes of traffic:
    - AIFSN
    - Transmit Ops
    - CW Minimum
    - CW Maximum
    - Use DSCP or 802.1p priority (DSCP by default)





6.2 Configure uAPSD on the Aastra phone

To configure the power save mode on the Aastra Phone 312:

1. Go to Menu | System | Network | Profiles.
2. Edit the profile you created.
3. Specify the power save mode.

This setting lets you specify which WLAN power save mode will be used during all voice connections.

6.3 Manually set the power save mode

In most cases the Auto selection will be the best setting for the phone's power save mode. However, not every AP supports all power save modes. This means that in some configurations, the Aastra Phone 312 will not be able to reliably detect the best power save mode to be used. In these cases you may need to manually specify another mode.

To manually configure the phone's power save mode, use the left softkey. You can select between:

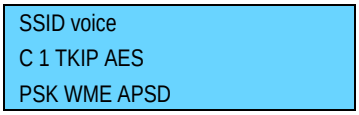
- **Auto**: In this mode, the device attempts to use uAPSD if the AP signals that it will support this. If the AP does not support uAPSD, the Aastra Phone 312 will use asynchronous PS-Poll. Support for uAPSD is supported can be determined in the Site survey mode. If serious interruptions in the voice connection occur quite frequently, use another power save mode, or else no power save mode at all.
- **uAPSD**: Unscheduled Automatic Power Save Delivery is defined in the 802.11e standard. This mode combines the longest battery life with highest sound quality. If you select this mode in the WLAN profile but it is not supported by the AP, the Aastra Phone 312 will not use a power save mode.
- **Async. PS-Poll**: This mode uses the PS-Poll packages defined in 802.11 in order to request voice packages from the AP. Unlike the standard, however, in this mode PS-Poll packages are not only used after the Beacons but asynchronously to them. This allows nearly achieving the battery life of uAPSD with identical sound quality. Not all APs support this mode. If serious interruptions in the voice connection occur quite frequently, you should use another power save mode, or else no power save mode at all.
- **802.11 PS-Poll**: This mechanism has been defined in the original 802.11 standard. A disadvantage is that a large part of the package is delayed by the duration of the beacon interval, impairing sound quality. Nevertheless, this mode may be useful if the AP supports no other power save mode, but you still want long talk times.
- **None (no power save mode)**: No power save mode is used. This reduces battery life for voice connections by at least half. This mode can be used if the AP is not compatible with any power save mode. In contrast to the other settings, this setting also deactivates the search for access points in the background, since this search also depends on the power save mode. Thus, with this mode handover behavior deteriorates.

6.4 Determine uAPSD support

To determine whether a WLAN supports uAPSD:

- On the Aastra Phone 312, use the Site survey tool from System | Network | Tools. This gives you a view of the different available SSIDs.

For example, if you choose the voice WLAN that was previously configured on the WESM zl, it displays:



This display indicates that for the voice WLAN, encryption is set to pre-shared key (PSK) with TKIP and AES protocols, and WME and APSD are supported.

7. Firmware versions and phone upgrade

7.1 Firmware versions used

ProCurve firmware versions used for this application note:

- K.13.09 for switch 5406zl
- WT.01.15 for WESM zl

Aastra Wireless Phone 312 firmware:

- wipp-1.0.8rc5.dnld

7.2 Upgrade phone's firmware

To upgrade the Aastra Phone 312 firmware, you copy the .dnld firmware file from a TFTP server reachable from the WLAN to which the phone is connected. To upgrade the firmware:

1. Connect the phone to a WLAN from which the TFTP server is reachable.
2. On the phone go to: Menu | System | Software | Update
3. In Settings, enter the protocol (ftp, http or tftp), the server IP address, and the file name.

8. Reference documents

This concludes the procedures for enabling interoperability between a ProCurve switch and the Aastra Phone 312. If you have further questions about using ProCurve switches and Wireless Edge Services Modules to support convergence, additional information can be found in these sources:

- For user manuals for ProCurve 3500yl-5400zl-8212zl switches:
  http://www.hp.com/rnd/support/manuals/3500-6200-5400-ChapterFiles.htm

- For Wireless Edge Services Module zl manuals:
  http://www.hp.com/rnd/support/manuals/wireless_zl.htm

- For PCM+ and IDM manuals:
  http://www.hp.com/rnd/support/manuals/ProCurve-Manager.htm
  http://www.hp.com/rnd/support/manuals/IDM.htm

- For information on Aastra wireless phone 312:
  http://www.aastraonline.com/index.php?option=com_content&task=view&id=154&Itemid=159&lang=en

For further information, please visit www.procurve.eu

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